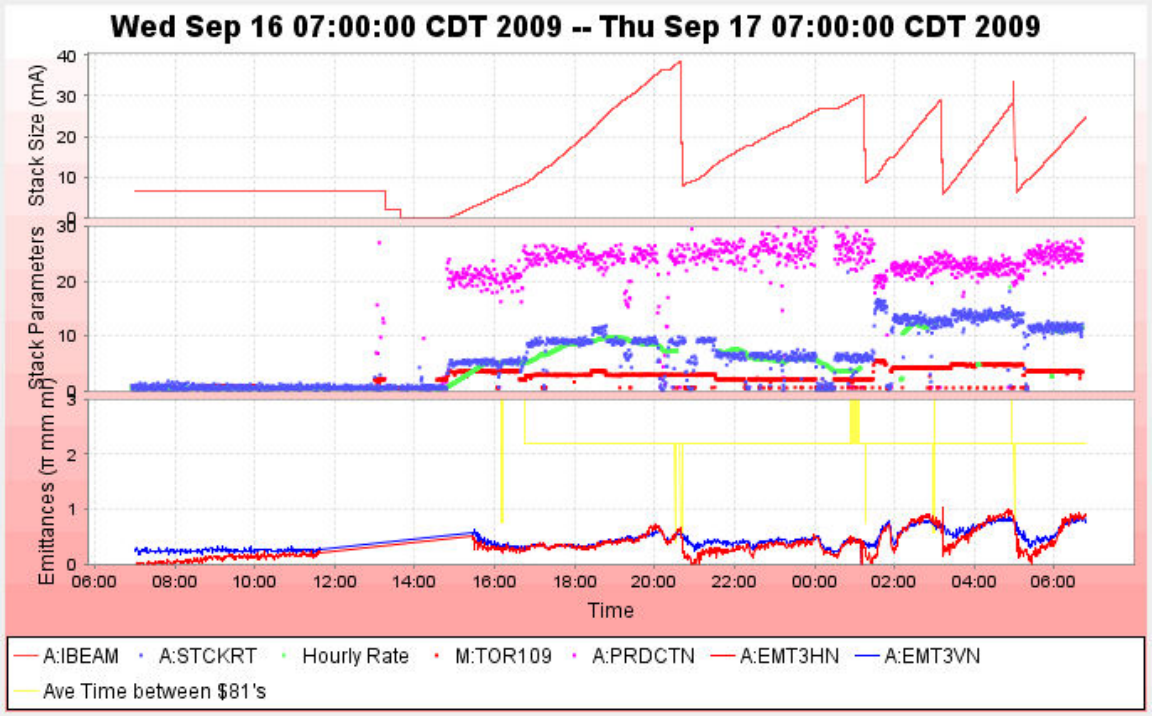
2009-09-17 Thursday Pbar Notes

Thursday, September 17, 2009
6:49 AM

Stacking



- We were spinning 6.7mA
  - Early afternoon, we transferred about 5mA over to Recycler
  - Attempted to do tunes across the aperture, but the signal from the remaining beam was just not good enough to get a measurement.
- By mid-afternoon, we were able to turn on and establish stacking.
  - Cryo cool-down progressed very well.
  - Debuncher Cryo preamps interlocks clear at 40K, not 5K
- Ops helped by tuning up overnight.
- Can run the Stacktail Monitor ACL script or the Core 4-8GHz babysitter, not both because it drives the 4-8GHz too hard and trips TWTs.
- Stacked OK overnight
  - When running 4 turn mixed mode
    - <protons on target> = 2.9e12
    - <stack rate> = 10.8mA/hr
    - <production> = 24 e-6/p
  - When running 6 turns stacking only
    - <protons on target> = 4.1e12
    - <stack rate> = 13mA/hr
    - <production> = 22 e-6/p
  - When running 8 turns mixed mode at the end
    - <protons on target> = 4.8e12
    - <stack rate> = 16mA/hr
    - <production> = 21 e-6/p
  - When running 10 turns stacking only
    - <protons on target> = 5e12
    - <stack rate> = 14mA/hr
    - <production> = 17 e-6/p

Transfers

Column 4 Number_3_Transfer Time		Column 21 Number_20_A:IBEAMB sampled on $91 (A:BEAM7), E10	Column 22 Number_21_A:IBEAMB sampled on $94 (A:BEAM9), E10	Unstacked (mA)	Column 23 Number_22_R:BEAMS (R:BEAME0[0]) pre xfer E10	Column 24 Number_23_R:BEAM (R:BEAME0[1]) post xfer, E10	Stashed	Acc to RR Eff	Acc to MI Eff	Acc to MI2 Eff	Transfers	Sets	Column 5 Number_4_Acc Horizontal Emittance	Column 6 Number_5_Acc Vertical Emittance
Totals =>				104.97			94.87	90.38%	94.75%	94.67%	9	5	4.3856	4.7906
Thursday, September 17, 2009	4:59	28.66	6.20	23.09	70.10	90.60	20.70	89.66%	94.74%	95.27%	2	1	6.484	7.111
Thursday, September 17, 2009	3:09	29.01	5.79	23.82	49.15	70.43	21.47	90.12%	94.22%	94.55%	2	1	5.599	5.914
Thursday, September 17, 2009	1:13	30.40	8.75	21.90	29.23	49.31	20.16	92.05%	95.50%	95.24%	2	1	3.017	3.758
Wednesday, September 16, 2009	20:38	38.57	7.65	31.38	1.65	29.47	27.84	88.72%	93.81%	93.30%	2	1	4.996	4.948
Wednesday, September 16, 2009	13:15	6.66	1.89	4.78	0.06	4.76	4.70	98.45%	100.25%	98.81%	1	1	1.832	2.222

- Unstacked 105mA in nine transfers over five sets.
  - Average overall efficiency was 90%.
- Sequencer command has SQL_TM0 error on BPM_SPEC P1 Line Flash Frame
- Longitudinal extraction display shows low amplitude on bunches.
- Core 4-8GHz runs too hard during transfers and trips TWTs.

Studies

Requests

- Tune-up during day and evening shift.

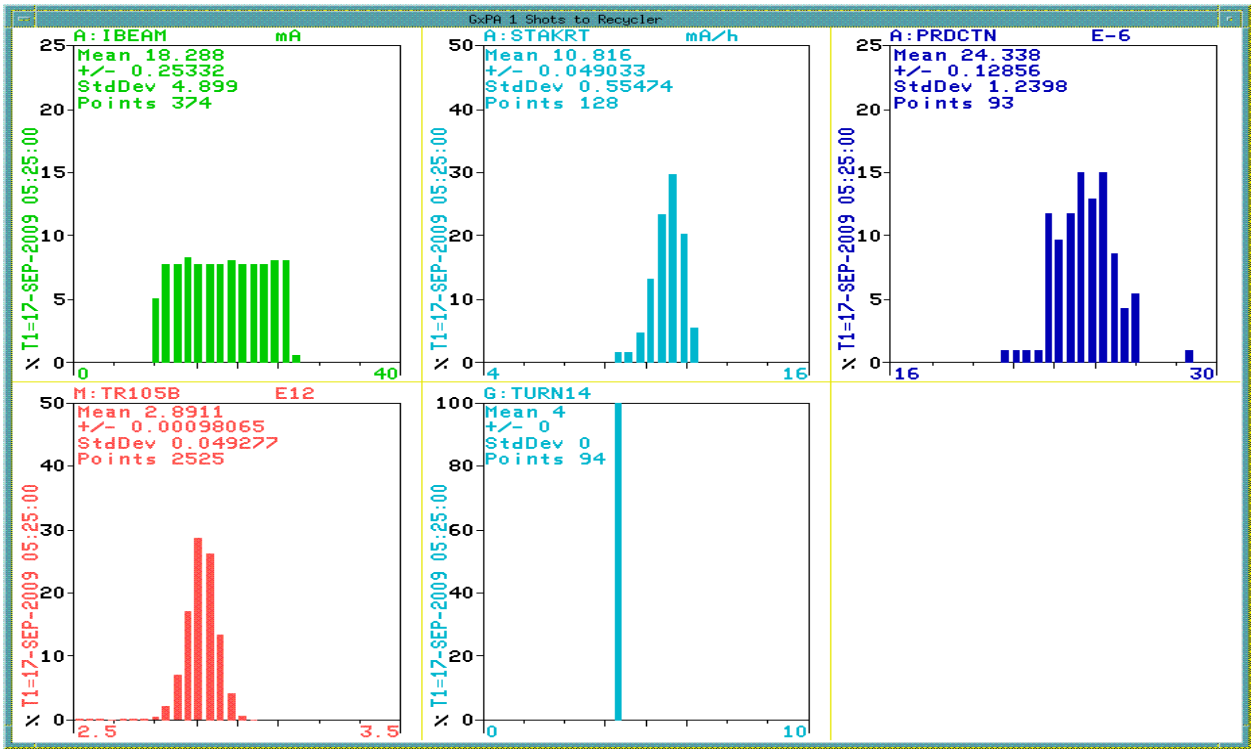
The Numbers

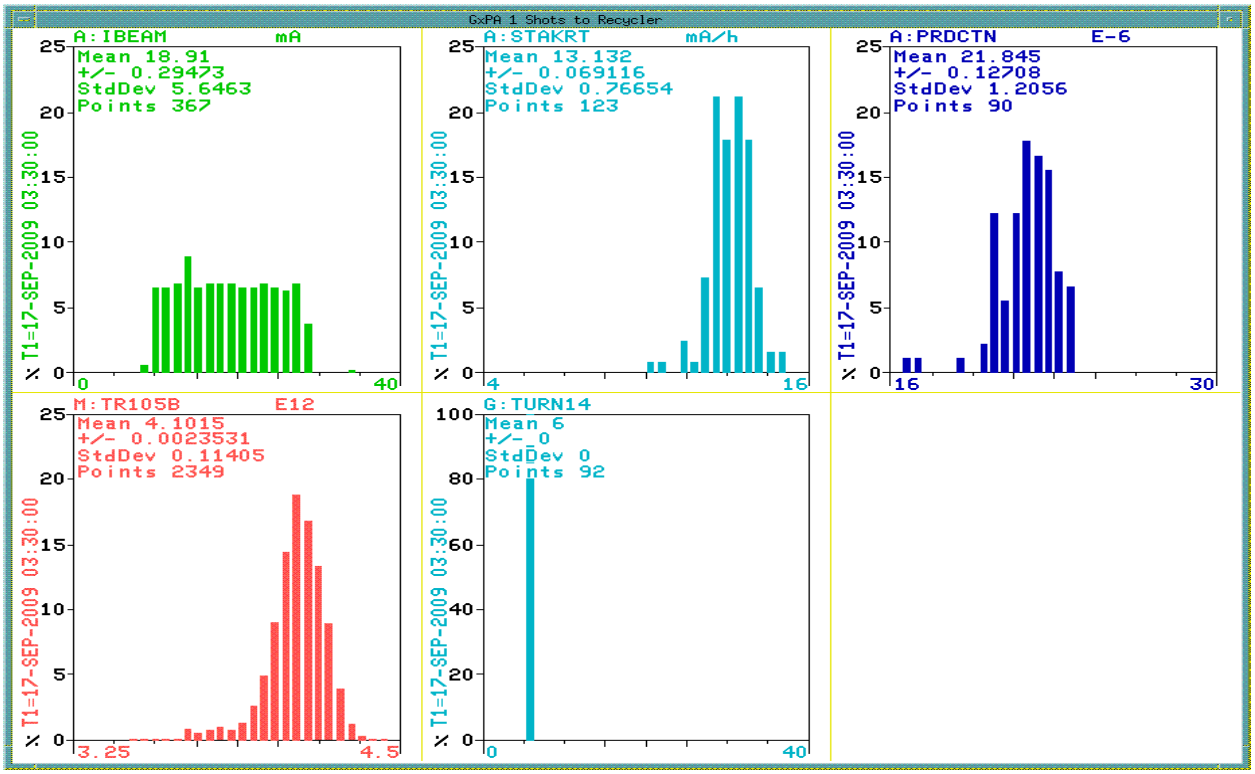
- Paul's Numbers
- Al's Numbers
  - Stacking
    - Pbars stacked: 129.58 E10
    - Time stacking: 22.77 Hr
    - Average stacking rate: 05.69 E10/Hr
  - Uptime
    - Number of pulses while in stacking mode: 24884
    - Number of pulses with beam: 16683
    - Fraction of up pulses was: 67.04%
  - The uptime's effect on the stacking numbers
    - Corrected time stacking: 15.26 Hr
    - Possible average stacking rate: 08.49 E10/Hr
    - Could have stacked: 193.28 E10/Hr
  - Recycler Transfers
    - Pbars sent to the Recycler: 104.97 E10
    - Number of transfers : 9
    - Number of transfer sets: 5
    - Average Number of transfer per set: 1.80
    - Time taken to shoot including reverse proton tuneup: 00.04 Hr
    - Transfer efficiency: 88.81%
  - Other Info
    - Average POT : 2.96 E12
    - Average production: 26.23 pbars/E6 protons
  - * Red indicates a problem during data retrieval. See the message window for

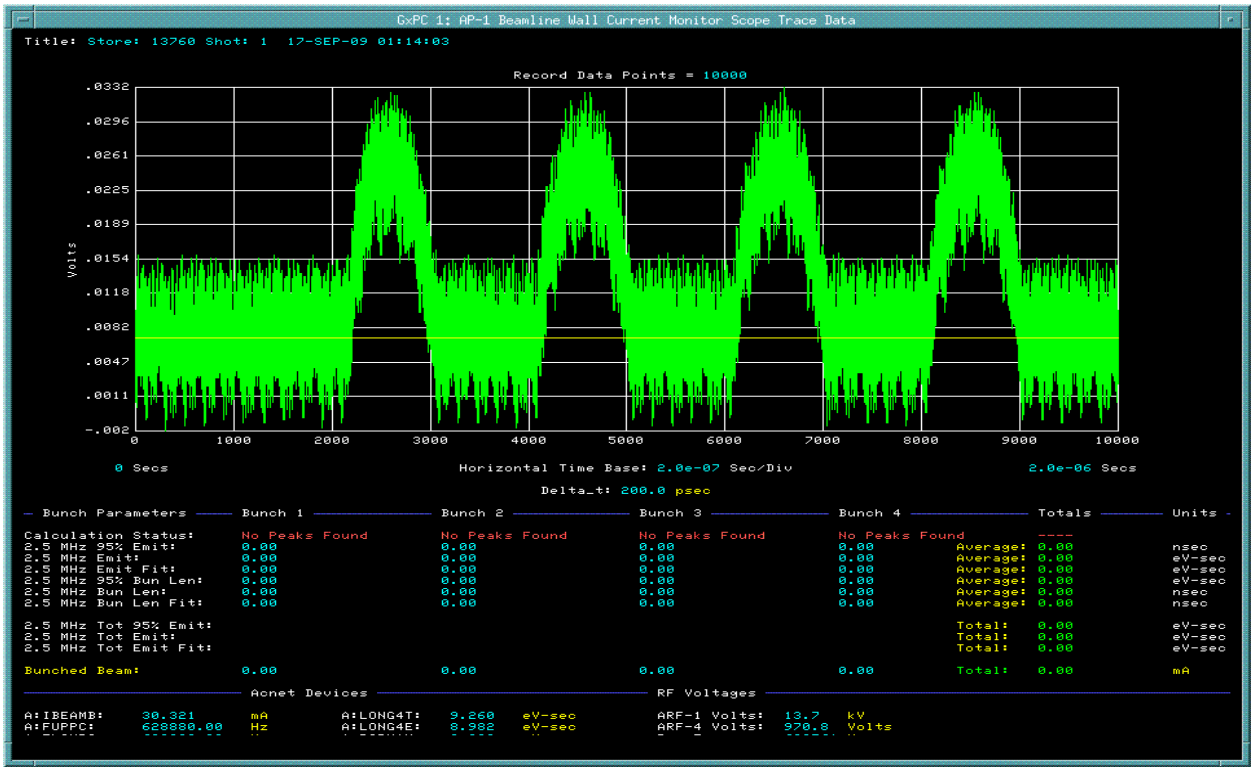
details.

- * Missed one or more A:IBEAM7 events somewhere in the middle of the user selected time span. Calculated time shot using 13 secs per transfer.

Plots






GxPC 1: AP-1 Beamline Wall Current Monitor Scope Trace Data
Title: Store: 13760 Shot: 1 17-SEP-09 01:14:03
Record Data Points = 10000
Volts
.0332
.0296
.0261
.0225
.0189
.0154
.0118
.0082
.0047
.0011
-.002
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
0 Secs
Horizontal Time Base: 2.0e-07 Sec/Div
2.0e-06 Secs
Delta_t: 200.0 psec
Bunch Parameters
Bunch 1
Bunch 2
Bunch 3
Bunch 4
Totals
Units
Calculation Status: No Peaks Found No Peaks Found No Peaks Found No Peaks Found ----
2.5 MHz 95% Emit: 0.00 0.00 0.00 0.00 Average: 0.00 nsec
2.5 MHz Emit: 0.00 0.00 0.00 0.00 Average: 0.00 eV-sec
2.5 MHz Emit Fit: 0.00 0.00 0.00 0.00 Average: 0.00 eV-sec
2.5 MHz 95% Bun Len: 0.00 0.00 0.00 0.00 Average: 0.00 eV-sec
2.5 MHz Bun Len: 0.00 0.00 0.00 0.00 Average: 0.00 nsec
2.5 MHz Bun Len Fit: 0.00 0.00 0.00 0.00 Average: 0.00 nsec
2.5 MHz Tot 95% Emit: Total: 0.00 eV-sec
2.5 MHz Tot Emit: Total: 0.00 eV-sec
2.5 MHz Tot Emit Fit: Total: 0.00 eV-sec
Bunched Beam: 0.00 0.00 0.00 0.00 Total: 0.00 mA
Acnet Devices
RF Voltages
A:IBEAMB: 30.321 mA
A:FUPPC: 628880.00 Hz
A:LONG4T: 9.260 eV-sec
A:LONG4E: 8.982 eV-sec
ARF-1 Volts: 13.7 kV
ARF-4 Volts: 970.8 Volts